Amendment to the Claims:

1. (Currently amended) A method of perfusion imaging comprising:

[[-]] performing a first magnetic resonance data acquisition with gradient encodings for random motion at a first sensitivity value[[,]];

[[-]] performing a set of at least six second magnetic resonance data acquisitions with gradient encodings for random motion in different directions at second sensitivity values larger than the first sensitivity value[[,]]; and

[[-]] determining a perfusion tensor based on the magnetic resonance data acquisitions.

2. (Currently amended) The method of perfusion imaging of claim 1, the second sensitivity values being below 50 s/mm^2 ~~and the first sensitivity value being substantially smaller than the second sensitivity values~~.

3. (Currently amended) The method of perfusion imaging of claim 1, ~~whereby~~ wherein the first sensitivity value is substantially zero and the second sensitivity values being between five and thirty~~, preferably ten~~.

4. (Currently amended) The method of perfusion imaging of claim 1, the magnetic resonance data acquisitions being performed by ~~means of~~ a series of single-shot echo-planar magnetic resonance data acquisitions.

5. (Currently Amended) The method of perfusion imaging of claim 1, further comprising:

performing a perfusion tensor visualisation ~~step~~.

6. (Currently amended) The method of perfusion imaging of claim 5, ~~whereby~~ further comprising:

deriving directional information ~~derived~~ from the perfusion tensor, the performing of a perfusion tensor visualization including visualizing the derived directional information ~~is visualized~~.

7. (Currently amended) The method of perfusion imaging of claim 1, further comprising:

determining ~~of~~ first slope values between each one of the set of magnetic resonance data acquisitions and the first magnetic resonance data acquisition[[,]]; and

determining the perfusion tensor based on the first slope values.

8. (Currently amended) The method of perfusion imaging of claim 1, further comprising:

[[-]] performing ~~of~~ a third magnetic resonance data acquisition at a third sensitivity value[[,]];

[[-]] performing ~~of~~ a fourth magnetic resonance data acquisition at a fourth sensitivity value, the third sensitivity value being ~~substantially~~ higher than the second sensitivity values, and the fourth sensitivity value being ~~substantially~~ higher than the third sensitivity value[[,]];

[[-]] determining ~~of~~ a diffusion coefficient and a fraction value based on the third and the fourth magnetic resonance data acquisitions to provide a diffusion signal component[[,]];

[[-]] eliminating ~~of~~ the diffusion signal component from the magnetic resonance data acquisitions to provide a perfusion signal component[[,]]; and

[[-]] determining ~~of~~ a perfusion tensor from the perfusion signal components.

9. (Currently amended) The method of perfusion imaging of claim 8, ~~whereby~~ wherein a set of at least six third magnetic resonance data acquisitions with gradient encodings for random motion in different directions at third sensitivity values is performed, and a set of at least six fourth magnetic resonance data acquisitions with gradient encodings for random motion in different directions at fourth sensitivity values is performed, and the diffusion tensor ~~tensor~~ is determined based on the third and the fourth magnetic resonance data acquisitions to provide a diffusion signal component.

10. (Previously presented)The method of perfusion imaging of claim 8, the third sensitivity value being between 100 and 400, and the second sensitivity value being between 600 and 1200.

11. (Currently amended) ~~The~~ A method of perfusion imaging ~~of claim 1, further~~ comprising:

performing a first magnetic resonance data acquisition with gradient encodings for random motion at a first sensitivity value;

performing a set of at least six second magnetic resonance data acquisitions with gradient encodings for random motion in different directions at second sensitivity values;

[[-]] selecting one of the second magnetic resonance data acquisitions having the strongest measured signal decay[[,]];

[[-]] performing a third magnetic resonance data acquisition at a third sensitivity value, the third sensitivity value being ~~substantially~~ higher than the second sensitivity values[[,]];

[[-]] determining ~~of~~ a diffusion coefficient and a fraction value based on the selected second and third magnetic resonance data acquisitions to provide a diffusion signal component[[,]];

[[-]] eliminating the diffusion signal component from the magnetic resonance data acquisitions to provide a perfusion signal component[[,]]; and

[[-]] determining ~~of~~ a perfusion tensor from the perfusion signal components.

12. (Currently amended) A computer program product~~, in particular~~ comprising a digital storage medium~~, for~~ storing a perfusion imaging ~~comprising~~ program ~~means for~~ executable to perform a method including determining a perfusion tensor based on a first magnetic resonance data acquisition and a set of at least six second magnetic resonance data acquisitions, the first magnetic resonance data acquisition being performed at a first sensitivity value and the second magnetic data resonance data acquisitions being performed at a second sensitivity value with

gradient encodings in different directions, ~~whereby~~ the first sensitivity value ~~is~~ being ~~substantially~~ below the second sensitivity values, and ~~for performing~~ further executable to perform [[a]] perfusion tensor imaging ~~step~~.

13. (Currently amended) The computer program product of claim 12, wherein the perfusion imaging program ~~means being adapted~~ is further executable to determine ~~of~~ first slope values for each one of the second magnetic resonance data acquisitions based on the first magnetic resonance data acquisition and to determine the perfusion tensor based on the first slope values.

14. (Currently amended) The computer program product of claim 12, wherein the perfusion imaging program ~~means being adapted~~ is further executable to determine a diffusion coefficient and a fraction value based on third and fourth magnetic resonance data acquisitions to provide a diffusion signal component, to eliminate the diffusion signal component from the magnetic resonance data acquisitions to provide a perfusion signal component, and to determine a perfusion tensor from the perfusion signal component.

15. (Currently Amended) The computer program product of claim of claim 14, wherein the perfusion imaging program ~~means being adapted~~ is further executable to process a set of at least six third magnetic resonance data acquisitions with gradient encodings for random motion in different directions at third sensitivity values, a set of at least six fourth magnetic resonance data acquisitions with gradient encodings for random motion in different directions at fourth sensitivity values, and to determine the diffusion tensor based on the third and the fourth magnetic resonance data acquisitions to provide a diffusion signal component.

16. (Currently Amended) The computer program product of claim 12, wherein the perfusion imaging program ~~means being adapted~~ is further executable to select one of the second magnetic resonance data acquisitions having the highest data value, determining of a diffusion coefficient and a fraction value based on the selected second magnetic resonance data acquisition and a third magnetic resonance data

acquisition being performed at a third sensitivity value, the third sensitivity value being ~~substantially~~ above the second sensitivity values, providing a diffusion signal component based on the diffusion coefficient and the blood fraction value, eliminating of the diffusion signal component from the magnetic resonance data acquisitions to provide a perfusion signal component, and to determine of a perfusion tensor from the perfusion signal components.

17. (Currently amended) A perfusion imaging apparatus comprising:

a magnetic resonance data acquisition device; and

a computer system programmed to [[-]] ~~means for performing~~ cause the magnetic resonance data acquisition device to perform a first magnetic resonance data acquisition at a first sensitivity value and ~~for performing~~ to perform a set of at least six second magnetic resonance data acquisitions with gradient encodings in different directions at second sensitivity values[[,]] below 50 s/mm^2, the first sensitivity value being smaller than the second sensitivity values, and further programmed to determine [[-]] ~~means for determining~~ a perfusion tensor based on the magnetic resonance data acquisitions[[,]]

[[-]] ~~means for performing perfusion tensor imaging~~.

18. (New) The perfusion imaging apparatus as set forth in claim 17, further comprising:

a display unit cooperating with the computer system to perform perfusion tensor imaging based on the determined perfusion tensor.

19. (New) The perfusion imaging apparatus as set forth in claim 17, wherein the first sensitivity value is substantially zero.

20. (New) The perfusion imaging apparatus as set forth in claim 17, wherein the computer system is further programmed to cause the magnetic resonance data acquisition device to perform at least one additional magnetic resonance data acquisition at a higher sensitivity value than the second sensitivity values, and is further programmed to determine a diffusion signal component of the first and second

magnetic resonance data acquisitions based on the at least one additional magnetic resonance data acquisition.